

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2007		2. REPORT TYPE		3. DATES COVERED 00-00-2007 to 00-00-2007	
4. TITLE AND SUBTITLE Monitoring Airborne Exposure Limits				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Chemical Materials Agency, 5183 Blackhawk Road, Aberdeen Proving Ground, MD, 21010-5424				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



U.S. ARMY CHEMICAL MATERIALS AGENCY

Monitoring airborne exposure limits

Proven monitoring technology ensures safe air for workers and the community

The revised AELs will require some operational changes that could affect how you perform your job. There are minimum guidelines that all facilities will follow as a result of the changes, but each site may have additional requirements as well. Those requirements are still being determined at this time. As sites move closer to implementing the revised AELs, there will be training provided to affected employees either from CMA or from your local systems contractor.

The U.S. Army Chemical Materials Agency (CMA) safely stores and disposes of chemical weapons located in different locations around the continental United States. Communities near these storage and disposal facilities rely on the agency and oversight groups, such as the Centers for Disease Control and Prevention (CDC) and the National Research Council, to ensure their safety as well as the safety of workers and the environment. One measure of safety these groups provide is proven monitoring systems placed in and around storage and disposal areas. These monitors are extra layers of protection to ensure workers and surrounding communities are not exposed to harmful concentrations of chemical agent in the air.

Defining Airborne Exposure Limits

Airborne Exposure Limits, also known as AELs, are limits set by the CDC to protect workers and the public from potential airborne concentration levels that would result in adverse health effects from acute exposures and to protect against risks from long-term exposure.

Recently, the CDC revised AELs for nerve agents GB and VX and blister agent HD. These agents are safely stored and destroyed at CMA storage and disposal facilities.

As a result, CMA will change some operational procedures such as adding more monitoring

stations and analyzing the results more frequently at a lower level to ensure workers are protected from extremely low levels of agent over long periods of time.

For more information on the CDC's revised nerve agent AELs, go to the GPO Access Web site at <http://www.gpoaccess.gov/fr/index.html>, choose advanced search, and look for the 2003 Federal Register, Volume 68, No. 196, pp.58348-58351.

Ensuring safety: Deploying the most advanced monitoring systems

CMA employs extremely sensitive, specially designed, high-technology monitoring systems that can detect agent concentrations at extremely low levels, well before any risk to the health or safety of workers, the community or the environment. These sophisticated systems are carefully located throughout storage and disposal facilities to ensure that detection occurs close to any potential sources of contamination.

- Approximately 250 monitors report conditions throughout each incineration technology-based facility and 70 throughout each neutralization technology-based facility.
- Monitoring stations are located in all process rooms, observation corridors, chemical agent munitions receiving areas, drain stations, neutralization bays, furnace ducts and the

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Monitoring airborne exposure limits (continued)

common exhaust stack for the furnace. As an added safety measure, they are also placed in the heating, ventilation, air conditioning system, the exhaust stack and filters.

- Since each monitor can detect only one type of agent in some areas, multiple monitors are set to detect different agents at the same time, in the same area.

Types of monitors used

Automatic Continuous Air Monitoring System (ACAMS) and MINICAMS®

- Near real-time automatic, continuous air monitors
- Detects nerve agents VX and GB and blister agent HD at extremely low concentration levels (parts per trillion range)
- Samples air, analyzes the sample, and displays the results. Depending upon the agent, cycle time is three to 10 minutes
- Triggers remote, audible, and visual alarms if agent is present
- Tested daily to ensure proper functioning

Depot Area Air Monitoring System (DAAMS)

- Historical monitors that continually sample air for chemical agent
- Detects nerve agents VX and GB and blister agent HD at extremely low concentration levels (parts per trillion range) to quantify or confirm the near real-time monitors
- Draws air through special glass tubes and traps any chemical agent in a special material. The tubes are collected and a laboratory analysis performed
- Sampling times vary from every few minutes to 12 hours
- Tested daily to ensure proper functioning

Continuous Emissions Monitoring Systems (CEMS) and Total Hydrocarbon Analyzers (THAs)

- Monitor for substances other than chemical agent
- Ensure efficient processing and compliance with environmental permits and regulations
- CEMS are used at incineration technology disposal facilities in furnace ducts and the common exhaust stack to monitor levels of carbon monoxide, carbon dioxide, nitric oxide, oxygen and sulfur dioxide.
- THAs are used at neutralization technology disposal facilities in ventilation ducts and stacks to monitor levels of volatile organic compounds.

Continuous improvement: Researching and developing monitoring systems

Although CMA uses the most advanced monitoring systems available, the agency realizes that technology constantly improves and new technology is constantly being developed. To ensure the agency has the most advanced monitoring systems available while safely storing and disposing of chemical weapons, CMA annually evaluates new equipment and methods for improving current monitoring systems.

Optimizing existing monitoring technology

CMA, in conjunction with relevant Department of Defense research and development agencies, is continuously looking at ways of optimizing existing technology such as increasing specificity, lowering detection limits and response times, and minimizing interferences. As technology improves, existing systems are upgraded and new systems are tested to ensure the most advanced technology is used to ensure workers, communities, and the environment are protected.

Exploring new monitoring technology

CMA employs monitoring experts who work in conjunction with the Edgewood Chemical Biological Center and the Joint Program Executive Office-Chemical and Biological Defense to continuously research, evaluate and compare emergent technologies to existing monitoring capabilities. Although new technologies are currently being tested, none tested to date have performed better than the current systems.

Oversight and guidance: Verification of monitoring systems

The Centers for Disease Control and Prevention routinely reviews CMA monitoring and quality assurance data to ensure that the agency's monitoring systems are functioning properly. In addition, the CDC periodically visits storage and disposal facilities to verify that all monitoring activities are being carried out according to strict quality-control procedures. For more information, check out the CDC brochure, "Demilitarization of Chemical Weapons: How Safe are Incinerators?" located on the Internet at www.cdc.gov.